

# *Summary of Draft EE/CA for the Upper Reach of the Housatonic River*

Presentation to the Citizens  
Coordinating Council  
Pittsfield, Massachusetts  
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*Joel S. Lindsay, PE, LSP  
EE/CA Lead Author  
Roy F. Weston, Inc.*

# *Overview of Presentation*

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- Site Investigation Activities
- Removal Action Objectives
- Extent of Removal and Estimated Removal Quantities
- Technologies Screening and Options
- Alternatives Evaluation
- Questions and Answers

# *Subreach Location Map*





# *Cobble Reach: Elm Street to Dawes Avenue*





# *Site Investigation Activities Sediment Sampling & Probing*





# *Site Investigation Activities*

## *Riverbank Soil Sampling*



# *Site Investigation Activities*

## *Geotechnical Borings*





# *Site Investigation Activities River Barge Borings*





# *Removal Action Objectives*

- Remove, treat, and/or manage river sediments and riverbank soils to prevent human and ecological exposures exceeding risk-based levels
- Prevent recontamination and downstream migration of contamination
- Minimize impacts on wetlands and floodplains
- Enhance habitat

# *PCB Cleanup Criteria*

- Sediment

- The cleanup objective is to prevent human and ecological exposure
- 1 ppm is the guideline for removal

- Riverbank Soil

- For residential properties, the cleanup criterion is 2 ppm
- For non-residential properties, the cleanup criterion is 10 ppm



# *Removal Goals*

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- Maintain riverbank stability
- Meet cleanup criteria
- Control erosion
- Maintain extent of property at top of riverbank
- Maintain river channel capacity

# *Estimated Mean PCB Concentrations in Sediments*

All Depths	19.8 ppm
0 to 1 ft	25.7 ppm
1 to 2 ft	33.2 ppm
2 to 3 ft	9.4 ppm
3 to 4 ft	1.2 ppm
> 4 ft	1.8 ppm



# *Sediment Excavation Depth to Achieve Cleanup Criteria*

- 2 to 3 ft depth for majority of EE/CA Reach
- 3.5 ft depth for small section at confluence of East and West Branches of the Housatonic River

# ***Riverbank Excavation Depth to Achieve Cleanup Criteria***

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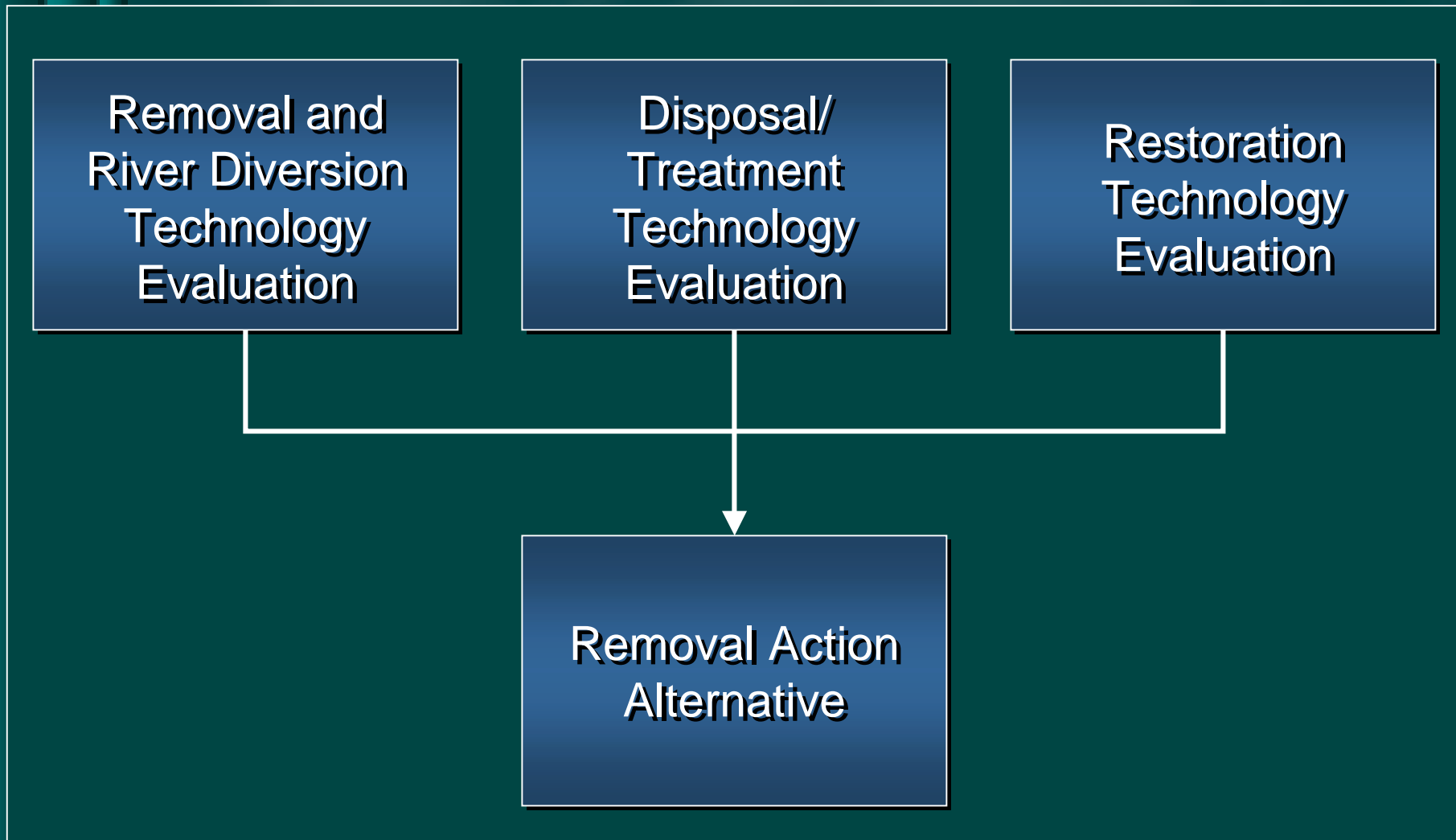
- 3 ft depth on residential properties
- 1 to 3 ft depth on non-residential properties



# *Estimated Removal Quantities*

■ Sediments	43,200 cy
■ Riverbanks	46,500 cy
■ Total Quantity	89,700 cy

# *Development of Removal Action Alternatives*



# *EE/CA Screening Criteria*

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- Effectiveness
- Implementability
- Cost



# *Removal and River Diversion Technologies*

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- Wet Excavation (no diversion)
- Dredging (no diversion)
- Dry Excavation
  - Diversion by sheetpiling
  - Diversion by bypass pumping or gravity
  - Diversion by alternate channel

# *Dredging*



# *Gravity Bypass*





# *Alternate Channel*



## *Removal Alternative 1: Wet Excavation*

- No river diversion
- Dig using excavators from work pad in river or on bank
- Engineering controls required to mitigate/control resuspension
- Estimated excavation rate: 150 cy/day (sediment)
- Excavation/backfill control issues
- Access mainly from river
- Estimated removal/restoration cost = \$18.8M

# *Removal Alternative 1: Wet Excavation*





## *Removal Alternative 2: Dry Excavation with Sheetpiling and Pumping Bypass*

- River diversion by sheetpile walls or pumping bypass pipe(s) in cobble reach
- Dewatering of excavation cells required
- Resuspension an issue during installation/removal of sheets and if overtopping occurs
- Good excavation/backfill control
- Estimated excavation rate: 250 cy/day (sediment)
- Significant riverbank access required
- Estimated removal/restoration cost = \$25.5M

# *Removal Alternative 2: Dry Excavation with Sheetpiling and Pumping Bypass*



### *Removal Alternative 3: Dry Excavation with Pumping Bypass*

- River diversion by pumping river water through pipe on bank
- Dewatering of excavation areas required
- Periodic flooding of excavation area likely
- Good excavation/backfill control
- Estimated excavation rate: 300 cy/day (sediment)
- Riverbank access needs less than sheetpiling
- Estimated removal/restoration cost = \$23.1M



# *Pumping Bypass: Dike Across River*



# *Pumping Bypass: Diversion Pipeline*





# *Pumping Bypass: Discharge at End of Diversion*



# ***Treatment/Containment/ Disposal Technologies***

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- Capping
- Thermal Desorption
- Solvent Extraction
- Incineration
- Soil Washing
- On-Site Consolidation at GE
- Off-Site Disposal



## *Disposal/Treatment Option A: Consolidation at GE with Excess Disposed Off-Site*

- The Consent Decree allows consolidation of 50,000 cy at GE; the remaining material goes off-site
- Effectively isolates PCBs
- Estimated disposal cost = \$12.4M
- If all material is consolidated at GE, estimated disposal cost = \$ 1.1M

## *Disposal/Treatment Option B: Disposal of All Material Off-Site*

- Proven method
- Combination of disposal sites
  - Solid Waste Landfill
  - RCRA C Landfill
  - TSCA Landfill
- Estimated disposal cost = \$27.4M

## *Disposal/Treatment Option C: Thermal Desorption Treatment with Off-Site Disposal of Treated Material*

- Requires suitable on-site treatment area
- Requires monitoring of emissions
- Reduces volume of PCB-contaminated soils and sediments
- Produces concentrated PCB waste
- Estimated disposal/treatment cost  
= \$50.5M



# *Thermal Desorption Treatment*



## *Disposal/Treatment Option D: Solvent Extraction Treatment with Off-Site Disposal of Treated Material*

- Requires extensive setup and work area; relatively complicated process
- Requires monitoring of emissions
- Reduces volume of PCBs in soils and sediments
- Solvents must be managed
- Estimated disposal/treatment cost  
= \$41.3M

# *Solvent Extraction*





# *Riverbed Restoration Plan*

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- Same for all alternatives
- Placement of stable riverbed backfill
- Create habitat diversity where feasible (different stone sizes, boulders)
- Use of deflectors, rock spurs, weirs

# *Riverbed Restoration Habitat Diversity*



# *Riverbank Restoration*

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- Same for all alternatives
- Restoration begins where riverbed erosion protection materials end (2-year storm height)
- Revegetation
- Bioengineering
- Hard structures



# ***Riverbank Restoration: Rock Armor and Vegetation***





# *Riverbank Restoration: Rock Armor and Vegetation After Construction*





# *Riverbank Restoration: Bioengineering During Construction*





# *Riverbank Restoration: Bioengineering with Dormant Willow Stakes*





# *Riverbank Restoration: Bioengineering After Stakes Sprout*





# *Riverbank Restoration: Hard Structures*





# *Alternative Cost Ranges*

Removal Alternatives	\$18.8M - \$25.5M
Disposal/Treatment Options	\$1.1M - \$50.5M
Overall Cost Range	\$19.9M - \$76.0M

# *What's Next?*

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- Remedy Review Board
- Finalize EE/CA with Recommended Alternative
- Public Review and Comment
- Action Memo

# *Questions & Answers*

